

## **Research on the use of construction materials and economic advantage of Karabakh**

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**Abstract :** Only 10 months have passed since the historical Victory achieved in the 44-day Patriotic War of Azerbaijan. It is truly amazing that a country that has come out of war, and is also struggling with a pandemic, is taking part in the restoration work in the liberated areas. The Karabakh administration is being reconstructed, modern infrastructure is being built from scratch, new roads, airports, power plants, villages, settlements are being built. It goes without saying that the construction work in Karabakh is an indicator of the strength and potential of the Azerbaijan.

**Key words:** Copper, Gold and other precious mineral resources.

### **1.INTRODUCTION**

In terms of global climate change, land desertification and the lack of clean drinking water, the environment is one of the main areas of concern to the entire international community.

These issues are reflected in the 17 Sustainable Development Goals of the UN. In particular, Goal 6 refers to the efficient use of water resources, water and sanitation. it's about speech; Goal 13 to take action to combat climate change; The 15th goal covers the protection and restoration of soil ecosystems, sustainable forest management, combating desertification, and stopping land degradation.

These goals, predicted by the United Nations until 2030, are Armenia's occupation policy that has been going on for nearly 30 years and has significantly damaged the ecology of the South Caucasus. is under serious threat. Illegal entrepreneurship and exploitation of natural resources in the occupied territories have resulted in great economic damage and numerous ecological consequences.

Forest clearing and burning, water resource pollution, flora and fauna destruction, natural resource exploitation have disturbed the ecological balance. The unhindered degradation of nature has caused a reaction of environmental organizations even in Armenia itself.

The ecological consequences of illegal economic activities in the previously occupied territories of Azerbaijan were reflected in the report of the Ministry of Foreign Affairs of Azerbaijan entitled "Illegal economic and other activities in the occupied territories of Azerbaijan".

International law classifies any military occupation as temporary by default and does not imply that the

occupying country acquires sovereignty over the occupied territory; therefore, the report of the Ministry of Foreign Affairs states that the legal status of this territory should not change due to the fact of occupation.

A region's natural resources may include minerals, water resources, and agricultural land. However, the specific details and scope of these resources may vary.

1. Minerals: The region may have deposits of various minerals, including metals and non-metals. This may include copper, gold and other precious mineral resources.

2. Water resources: Rivers and water bodies in the region can be important natural resources. Access to water is crucial for agriculture and various industrial activities.

3. Agricultural Lands: The fertility of the land in the region contributes to its agricultural potential. This includes farming, orchards and vineyards.

It is important to note that the use of these resources can be affected by geopolitical factors, territorial disputes and the general political and economic situation in the region.

For the most accurate and up-to-date information about the natural resources of Karabakh, it is recommended to refer to the latest reports, studies or official sources of the relevant institutions.

### **2.EXPERIMENTAL DETAILS**

Armenia's occupation of Azerbaijani lands for thirty years and during this period the man-made activities of our own historical lands with various ruthlessness of the enemy, during the battles, as well as the conduct of military operations, caused very serious damage to the beautiful environment of Karabakh.



Ore and non-ore deposits were looted, exploited without any man-made norms. 163 different types of mineral deposits with confirmed reserves have been discovered in the liberated territories of the Republic of Azerbaijan. Including 5 gold, 7 mercury, 2 copper, 1 lead and zinc, 1 stone coal, 1 raw material for the production of soda, 12 alloys and decorative stones - obsidian, marbleized onyx, jasper, etc., 10 sawstones, 21 facing stones, 9 clays, 20 cement raw materials, 8 different types of building stones, 6 lime raw materials, 10 sand-gravel, 4 construction sand, 1 perlite, 8 pumice-volcanic ash, 16 underground freshwater and 11 mineral water deposits are available.

Because of its versatility and abundance, clay has been used in construction for thousands of years. Its applications in construction include:

1. Brick and Tile production:

One of the most common uses of clay in construction is the production of bricks and tiles. Clay bricks are durable, fire resistant and can provide excellent insulation. They are widely used in the construction of walls, pavements and various architectural elements.

2. Land constructions:

Clay is often used in earth building techniques such as bricks and sticks. Adobe bricks are made by drying a mixture of clay, sand, straw and water in the sun. Cob involves mixing clay, sand and straw to create a pliable material used to build walls, houses or even sculptures.

3. Clay plasters and renders:

Clay plasters and renders are a natural alternative to cement-based plasters. They offer good thermal mass, breathability and a natural aesthetic. Clay plasters are applied to walls and ceilings for both functional and decorative purposes.

4. Clay roofing:

Clay is used in the production of roof coverings. Clay tiles are durable, weather resistant and can add a distinctive architectural style to buildings.

5. Geotechnical Applications:

Bentonite, a type of clay, is used in geotechnical engineering for a variety of purposes, such as creating impermeable barriers in construction projects, particularly in the lining of ponds, landfills, and underground structures.

6. Ceramic Products:

In addition to traditional construction, clay is used in the production of ceramic products, including floor and wall tiles, plumbing and decorative elements in buildings.

7. Greening and Land Improvement:

Some types of clay can be used for landscaping and soil improvement. For example, expansive clay soils can be stabilized to improve the foundation stability of buildings and prevent swelling and shrinkage.

8. Artistic and decorative elements:

Clay is often used to create artistic and decorative elements in construction, including sculptures, bas-reliefs, and other ornamental features.

The use of clay in construction is environmentally friendly as it is a natural material that can be obtained locally. However, it is important to consider the specific properties of clay, such as its composition and plasticity, to ensure its suitability for the intended construction purpose. In addition, appropriate engineering and construction practices must be followed to optimize the performance of clay-based materials in various applications..

It may not be possible to obtain specific information about copper deposits in Karabakh, and the geopolitical situation in the region may affect the availability of such information. However, the wider South Caucasus region, which includes Azerbaijan, is

known to have significant mineral resources, and copper is one of them.

Historically, copper mining was carried out in various parts of the South Caucasus. It is possible that, taking

into account the geological characteristics of Karabakh, there may be copper deposits.



Copper mining requires geological investigations, and the availability and extent of these deposits will depend on the results of such investigations.

For the latest and most accurate information about copper deposits in Karabakh, it is recommended to consult the relevant geological authorities, mining departments or official reports. Note that due to the geopolitical context, it may be difficult to obtain up-to-date and accurate information.

Specific details about gold deposits in Karabakh may not be available. However, the wider region of the South Caucasus, which includes Azerbaijan and Armenia, is known to have mineral resources, and gold is among them.

Historically, gold mining was carried out in various areas of the South Caucasus. With the geological characteristics of Karabakh, it is plausible that there may be gold deposits. Identifying and evaluating gold deposits usually requires geological surveys and prospecting.

### **3.CONCLUSION**

In order to obtain the most accurate and up-to-date information about gold deposits in Karabakh, it is advisable to consult the relevant geological authorities, mining departments or official reports. Due to the geopolitical context of the region, obtaining current and accurate information may be difficult and it is recommended to refer to the latest reports or studies from reliable sources.

Gold is not widely used as a structural material in construction due to its high cost and specific physical

properties. However, it is used in a variety of construction-related applications, particularly in decorative and functional capacities. Here are some ways to use gold in construction:

#### **1. Architectural Details:**

Gold is often used for decorative purposes in architecture. It can be incorporated into building facades, decorations and interior design to add a touch of luxury and elegance.

#### **2. Gilding:**

Gold leafing involves applying a thin layer of gold leaf or gold dust to surfaces. This technique is used to decorate architectural elements such as moldings, frames and sculptures, giving a bright and rich look.

#### **3. Jewelry in construction:**

Some high-end and luxury buildings incorporate gold elements such as gold-plated fixtures, railings and decorative elements to enhance the overall aesthetic and exclusivity.

#### **4. Electrical Applications:**

Gold is an excellent conductor of electricity and is used in various electrical and electronic components. In construction, gold can be found in electrical connectors, switches and other components in buildings with special or high-tech requirements.

#### **5. Gold Leaf in Artistic Designs:**

Gold leaf is often used in artistic and architectural designs. It can be applied to ceilings, domes and religious structures, adding a reflective and decorative layer to create visually striking effects.

#### **6. Monuments and Sights:**

In some cases, gold can be incorporated into monuments or landmarks as a symbolic or decorative element. This is often seen in structures intended to convey wealth, prestige or cultural significance.

#### 7. Gold Plated Glass:

Gold coatings on glass, known as gold-plated glass, can be used for aesthetic purposes or to provide thermal insulation by reflecting infrared rays. This application can be found in luxury buildings or structures with special energy efficiency requirements.

#### 8. Gold Plates and Finishes:

Gold-colored tiles and finishes can be used in interior design to create a luxurious atmosphere. These can be applied to walls, floors and other surfaces to achieve the desired aesthetic.

It is important to note that the use of gold in construction is often limited to specific projects where high quality aesthetics are desired and cost considerations are secondary. In most building applications, more common and cost-effective materials are used for structural elements, while gold is reserved to accentuate the design and add a touch of luxury.

Clay is a type of fine-grained natural soil material composed of minerals, organic matter, and other components. Its physical and chemical properties can vary depending on factors such as mineral composition, particle size and the presence of impurities. Some of the main physical and chemical properties of clay are:

#### Physical properties of clay:

##### 1. Particle size:

Clay particles are less than 0.002 millimeters in diameter, making them finer than silt and sand. The small particle size contributes to the plasticity and cohesion of the clay.

##### 2. Texture:

Clay has a smooth and sticky texture when wet due to its small particle size. When dry, it becomes hard and compact, forming a cohesive mass.

##### 3. Plasticity:

One of the main properties of clay is its plasticity. When wet, it can be easily molded and shaped, allowing it to be transformed into a variety of structures. This property is important in pottery and construction.

##### 4. Compatibility:

Clay exhibits high cohesion, meaning that its particles tend to stick together. This combination contributes to the strength and stability of the clay when compacted.

##### 5. Color:

The color of the clay varies and can range from light beige and yellow to red, brown or gray. This is

influenced by the mineral content and organic matter present in the clay.

##### 6. Conductivity:

Clay has low permeability, which means it has a reduced ability to allow water to pass through. This property contributes to its ability to retain moisture.

##### 7. Shrinkage and swelling:

Clay shrinks when it dries and swells when it absorbs water. These changes in volume can affect the stability of structures built with clay.

#### Chemical properties of clay:

##### 1. Mineral Composition:

The mineral composition of clay can include various minerals, for example, kaolinite, illite, montmorillonite and others. The specific minerals present affect the properties of the clay.

##### 2. Aluminum and Silicon Composition:

Clay minerals contain aluminum and silicon in their crystal structure. The ratio of aluminum to silicon affects the type of clay mineral and its behavior.

##### 3. Cation Exchange Capacity:

Clay has a high cation exchange capacity and allows the storage and exchange of positively charged ions. This feature is important for the retention of nutrients in the soil.

##### 4. pH:

The pH of clay can vary, but is generally neutral to slightly acidic. pH affects the availability of nutrients in the soil.

##### 5. Organic substances:

Clay may contain organic matter, which contributes to its fertility. Organic matter improves soil structure, water retention and nutrient availability.

##### 6. Adsorption:

Clay particles have the ability to adsorb (hold) water and other substances, including nutrients and pollutants. This property is important for soil fertility and environmental health.

Understanding the physical and chemical properties of clay is critical in a variety of industries, including agriculture, pottery, and construction.

In construction, clay is often used in the form of bricks, tiles and other building materials due to its plasticity and ability to create durable structures when fired.

#### Chemical properties of mercury:

##### 1. Chemical Symbol and Atomic Number:

The chemical symbol for mercury is Hg, from the Latin word "hydrargyrum". Its atomic number is 80 in the periodic table.

##### 2. Stability:

Mercury is relatively stable under normal atmospheric conditions. However, it slowly reacts with oxygen in the air and forms a thin oxide layer on its surface.

##### 3. Merger:

Mercury can amalgamate with other metals, that is, it can melt with them to form a mixture. The compound



is commonly used in gold and silver mining to extract these metals from the ore.

#### 4. Resolution:

Mercury is not soluble in water. This property contributes to its environmental persistence and ability to accumulate in aquatic ecosystems.

#### 5. Toxicity:

Mercury and its compounds are very toxic to humans and many other organisms. Toxicity is primarily due to the ability to form organic compounds such as methylmercury that can accumulate in living organisms.

#### 6. Corrosion resistance:

Mercury is resistant to corrosion and does not react readily with most acids and bases. However, it can form amalgams with certain metals.

#### 7. Thermometric properties:

The expansion and contraction of mercury with temperature changes makes it suitable for use in traditional mercury thermometers.

It is important to note that there are significant efforts to reduce mercury use and emissions due to its toxicity and environmental concerns. The Minamata Convention on Mercury is an international agreement aimed at minimizing anthropogenic mercury releases into the environment.

Mercury is a toxic heavy metal that poses serious health and environmental risks. In the context of construction, there are several potential sources of mercury exposure, and it's important to handle this substance with care. Here are some considerations related to mercury in construction:

#### 1. Lighting Devices:

Fluorescent lamps and some types of high-intensity discharge (HID) lamps contain small amounts of mercury. When these bulbs break, mercury vapor can be released, posing a health risk. Proper disposal and recycling of these bulbs are crucial to prevent mercury from entering the environment.

#### 2. Thermometers and Barometers:

Older thermometers and barometers may contain mercury. It's essential to handle them carefully and follow proper disposal procedures if they break. Modern alternatives without mercury are available.

#### 3. Flooring and Coating Materials:

Some types of flooring materials, such as certain types of vinyl, may contain mercury. Be aware of the materials being used in construction, and choose alternatives that are mercury-free if possible.

#### 4. Construction Waste:

Construction waste, including debris from demolitions or renovations, may contain materials with mercury. Proper disposal and recycling practices should be followed to prevent the release of mercury into the environment.

#### 1. Batteries:

Mercury-containing batteries, although less common today, can still be found in certain construction equipment. Proper disposal methods should be followed for these batteries.

#### 2. HVAC Systems:

Some heating, ventilation, and air conditioning (HVAC) systems may use mercury-containing switches. When replacing or maintaining these systems, care should be taken to minimize mercury exposure.



3. Protective Measures:

Construction workers should be educated about the risks of mercury exposure and provided with appropriate personal protective equipment (PPE) when working with materials that may contain mercury.

4. Regulatory Compliance:

Be aware of and comply with local regulations and guidelines regarding the use, handling, and disposal of mercury-containing materials. Many jurisdictions have strict rules regarding mercury to protect public health and the environment.

In summary, it's crucial to be aware of the presence of mercury in construction materials and equipment and take appropriate measures to minimize exposure and ensure proper disposal. This not only protects the health and safety of construction workers but also helps prevent environmental contamination.

Mercury is used in various industries for specific applications, but its usage has decreased significantly due to its toxicity and environmental concerns. Some historical and current industrial uses of mercury include:

1. Chlor-alkali Industry:

Mercury has been historically used in the production of chlorine and sodium hydroxide through a process called the mercury cell process. However, this process is being phased out in many regions due to environmental concerns.

2. Electrical and Electronics:

Some switches and relays in electrical equipment, as well as certain types of batteries, historically contained mercury. However, efforts have been made to phase out the use of mercury in these applications due to environmental and health risks.

3. Thermometers and Barometers:

Traditional thermometers and barometers often contained mercury. However, modern alternatives, such as digital thermometers, have largely replaced mercury-containing devices in many applications.

4. Dental Amalgams:

Dental amalgams, which are used for dental fillings, traditionally contained mercury. While the use of mercury amalgams has decreased, they are still used in some dental applications. The dental industry has been exploring alternative materials to reduce mercury exposure.

5. Mining and Ore Processing:

Mercury has been used in gold and silver mining to extract precious metals from ore. However, this practice is known to cause environmental pollution and health risks. Efforts are being made to reduce or eliminate the use of mercury in artisanal and small-scale gold mining.

6. Chemical Industry:

Some industrial processes use mercury as a catalyst or reagent. However, alternatives are often sought to minimize the use of mercury due to its environmental impact.

7. Fluorescent Lamps and Bulbs:

Compact fluorescent lamps (CFLs) and some types of high-intensity discharge (HID) lamps contain small amounts of mercury. Efforts are made to promote the use of mercury-free LED lighting as an alternative.

8. Laboratory Instruments:

Some scientific instruments, such as certain types of barometers and thermometers used in laboratories, may contain mercury. Laboratories are increasingly using digital alternatives and mercury-free equipment.

It's important to note that many industries and regulatory bodies are working towards reducing or eliminating the use of mercury in various applications due to its known environmental and health risks. International agreements, such as the Minamata Convention on Mercury, aim to phase out or reduce the use of mercury globally to protect human health and the environment.

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